

CLAIMS

1 1. An oral brush suitable for massaging the gums,
2 comprising:
3 an elongated body;
4 a head portion extending from said body; and
5 a brush portion comprising a plurality of bristles
6 extending from said head portion, said bristles comprising a
7 thermoplastic elastomer having a Shore A hardness of 30 or
8 greater.

1 2. The oral brush of claim 1 wherein said
2 thermoplastic elastomer is selected from the group
3 consisting of polyetheramides, polyesters, styrene-ethylene-
4 butylene-styrene block copolymers, styrene-butadiene-styrene
5 block copolymers, styrene-isoprene-styrene block copolymers,
6 polyurethanes, polyolefin elastomers, and mixtures thereof.

1 3. The oral brush of claim 1 or 2 wherein said
2 thermoplastic elastomer has a flexural modulus of at least 5
3 MPa.

1 4. The oral brush of claim 1, said oral brush
2 further comprising a spacer attached to a base of said head
3 portion, said spacer comprising said thermoplastic elastomer
4 and integrally joined to said bristles.

1 5. The oral brush of claim 1 wherein said brush
2 portion further comprises a plurality of bristles formed of
3 a non-elastomeric material.

1 6. The oral brush of claim 5 wherein said non-
2 elastomeric material is selected from nylon and polyamides.

1 7. The oral brush of claim 6 wherein said non-
2 elastomeric material is a crystalline polyphthalamide formed
3 by polymerization of terphthalic acid, isophthalic acid and
4 adipic acid with hexamethylene diamine.

1 8. The oral brush of claim 5 wherein said non-
2 elastomeric material comprises an abrasive additive.

1 9. The oral brush of claim 5, further comprising a
2 spacer attached to a base of said head portion, said
3 bristles formed of said non-elastomeric material extending
4 from said head portion through said spacer.

1 10. An oral brush comprising:
2 an elongated body;
3 a head portion extending from said body; and
4 a brush portion comprising a plurality of bristles
5 extending from said head portion, said bristles comprising a
6 thermoplastic elastomer selected from the group consisting
7 of polyetheramides, polyesters, styrene-ethylene-butylene-
8 styrene block copolymers, styrene-butadiene-styrene block
9 copolymers, styrene-isoprene-styrene block copolymers,
10 polyurethanes, polyolefin elastomers, and mixtures thereof.

1 11. The oral brush of claim 10 wherein said brush
2 portion further comprises a plurality of bristles formed of
3 a non-elastomeric material.

1 12. The oral brush of claim 11 wherein said non-
2 elastomeric material is selected from polyamides and
3 polyesters.

1 13. The oral brush of claim 12 wherein said non-
2 elastomeric material is a crystalline polyamide formed by
3 polymerization of terphthalic acid, isophthalic acid and
4 adipic acid with hexamethylene diamine.

1 14. The oral brush of claim 11 wherein said non-
2 elastomeric material comprises an abrasive additive.

1 15. The oral brush of claim 11, said oral brush
2 further comprising a spacer attached to a base of said head
3 portion, said bristles formed of said non-elastomeric
4 material extending from said head portion through said
5 spacer.

1 16. The oral brush of claim 10 wherein said
2 thermoplastic elastomer has a flexural modulus of at least 5
3 MPa.

1 17. The oral brush of claim 10, said oral brush
2 further comprising a spacer attached to a base of said head
3 portion, said spacer comprising said thermoplastic elastomer
4 and integrally joined to said bristles.

1 18. An oral brush comprising:
2 an elongated body;
3 a head portion extending from said body; and
4 a brush portion comprising a plurality of bristles
5 extending from said head portion, said bristles comprising a
6 thermoplastic elastomer having a flexural modulus of at
7 least 5 MPa.

1 19. The oral brush of claim 18, said oral brush
2 further comprising a spacer attached to a base of said head

3 portion, said spacer comprising said thermoplastic elastomer
4 and integrally joined to said bristles.

1 20. An oral brush comprising:
2 an elongated body;
3 a head portion extending from said body; and
4 a brush portion comprising, extending from said head
5 portion, a plurality of bristles comprising a thermoplastic
6 elastomer and a plurality of bristles comprising a
7 polyphthalamide.

1 21. The oral brush of claim 20 wherein said
2 polyphthalamide is formed by polymerization of terphthalic
3 acid, isophthalic acid and adipic acid with hexamethylene
4 diamine.

1 22. The oral brush of claim 21 wherein said
2 polyphthalamide comprises an abrasive additive.

1 23. The oral brush of claim 20, said oral brush
2 further comprising a spacer attached to a base of said head
3 portion, said spacer comprising said thermoplastic elastomer
4 and integrally joined to said bristles comprising said
5 thermoplastic elastomer.

1 24. The oral brush of claim 23, wherein said
2 bristles comprising said polyphthalamide extend from said
3 head portion through said spacer.

1 25. A method of massaging the gums comprising
2 contacting the gums with a bristle formed of a thermoplastic
3 elastomer having a Shore A hardness of at least 30.

1 26. A method of massaging the gums comprising
2 contacting the gums with a bristle formed of a thermoplastic
3 elastomer having a flexural modulus of at least 5 MPa.

1 27. A method of massaging the gums comprising
2 contacting the gums with a bristle formed of a thermoplastic
3 elastomer selected from the group consisting of
4 polyetheramides, polyesters, styrene-ethylene-butylene-
5 styrene block copolymers, styrene-butadiene-styrene block
6 copolymers, styrene-isoprene-styrene block copolymers,
7 polyurethanes, polyolefin elastomers, and mixtures thereof.

1 28. An oral brush comprising:
2 an elongated body;
3 a head portion extending from said body; and
4 a brush portion comprising a plurality of bristles
5 extending from said head portion, said bristles comprising a
6 thermoplastic elastomer sheath, comprising a thermoplastic
7 elastomer selected from the group consisting of
8 polyetheramides, polyesters, styrene-ethylene-butylene-
9 styrene block copolymers, styrene-butadiene-styrene block
10 copolymers, styrene-isoprene-styrene block copolymers,
11 polyurethanes, polyolefin elastomers, and mixtures thereof,
12 surrounding a non-thermoplastic elastomer core material.

1 29. The oral brush of claim 28 wherein said
2 bristles are formed by coextrusion.

1 30. The oral brush of claim 28 wherein said core
2 material is selected from polyamides and polyesters.

1 31. The oral brush of claim 28 wherein said
2 bristles have a diameter of from 5 to 8 mil.

32. The oral brush of claim 28, said oral brush further comprising a spacer attached to a base of said head portion, said spacer comprising said thermoplastic elastomer and integrally joined to said bristles.

1 33. A method of making a toothbrush bristle
2 comprising coextruding a plurality of polymers to form an
3 elongated filament having a plurality of separate phases.

1 34. The method of claim 33 wherein one of said
2 polymers comprises a thermoplastic elastomer.

1 35. The method of claim 33 wherein said polymers
2 are coextruded in a sheath/core geometry.

1 36. The method of claim 33 further comprising
2 applying tension to said filament to draw the filament.

1 37. The method of claim 36 wherein the tension is
2 applied at a drawdown ratio of from 1:1 to 7:1.

1 38. An oral brush comprising:
2 an elongated body;
3 a head portion extending from said body; and
4 a brush portion comprising a plurality of bristles
5 extending from said head portion, said bristles comprising a
6 thermoplastic elastomer sheath surrounding a core comprising
7 a thermoplastic elastomer having a higher hardness than said
8 thermoplastic elastomer sheath.

1 39. An oral brush comprising:
2 an elongated body;
3 a head portion extending from said body;
4 and a brush portion comprising a plurality of
5 bristles extending from said head portion, said bristles
6 comprising a blend comprising an elastomeric polymer and a
7 non-elastomeric polymer.

1 40. The oral brush of claim 39, said oral brush
2 further comprising a spacer attached to a base of said head
3 portion, said spacer comprising said thermoplastic elastomer
4 and integrally joined to said bristles.

1 41. The oral brush of claim 39 wherein said
2 elastomeric polymer is selected from the group consisting of
3 thermoplastic elastomers and vulcanized rubber-type
4 polymers.

1 42. The oral brush of claim 41 wherein said
2 elastomeric polymer comprises a thermoplastic elastomer
3 selected from the group consisting of polyamide
4 thermoplastic elastomers, polyester thermoplastic
5 elastomers, and olefinic thermoplastic elastomers.

1 43. The oral brush of claim 41 wherein said
2 elastomeric polymer comprises a vulcanized rubber-type
3 polymer selected from the group consisting of natural
4 rubber, cross-linked polybutadiene, and cross-linked
5 polyacrylates and mixtures thereof.

1 44. The oral brush of claim 39 wherein said
2 elastomeric polymer and said non-elastomeric polymer are
3 provided in a ratio of from 10:90 to 90:10.